Sustainable Fort Carson

SUSTAINABLE FORT CARSON
RIGHT ACTIONS. RIGHT NOW!

2014 ANNUAL REPORT

"Sustainable Fort Carson—Enduring G.E.M. of the West!"*

G=Green
E=Environment and Economy
M=Model

*From: 2002 Sustainability Charter

Achieving Our Vision

Best Hometown in the Army—Home of America's Best

Fort Carson in collaboration with community stakeholders established our sustainability vision in 2002:

"We envision Fort Carson 25 years from now:

- Enduring like a National Treasure
- Inspiring as a model of sustainability
- Restoring the environment
- Returning value to the community"

We have tried to maintain the sustainability vision set for us nearly 20 years ago despite the many significant changes and challenges facing our Nation, the Army, our Soldiers, Families, Civilians, Installation and community.

As we lean forward on this next leg of our sustainability journey, we value your partnership, creativity and innovative ideas now more than ever! We seek your collaboration to address regional challenges, improve quality of life in the region and leave a legacy of stewardship for future generations.

Joel D. Hamilton
Colonel, U.S. Army
Garrison Commander

Progress at a Glance

- Energy and Water
- Transportation
- Development
- Air Quality
- Procurement
- Zero Waste
- Training Lands

Success in achieving a goal or successful movement along a predetermined timeline within a goal plan

Positive movement toward goal objective or timeline is quantifiable, but not yet achieved.

Significant impediments to goal objective or timeline exists. Future success in jeopardy.

2014 Accomplishments

- Improved our energy efficiency by 16% compared to 2003
- Reduced our drinking water use by about 55% compared to 2002
- Added 2 high performance buildings to the facility inventory for a total of 80
- Diverted 49% of solid waste away from Landfills
- Operated free shuttle services for over 10,000 Soldiers per month

History of Stewardship and Sustainability

We have a long history of striving to be good environmental stewards and in 2002 made a commitment to pursue 'big, hairy audacious goals' in keeping with the Army's Strategy for the Environment and Triple Bottom Line.

Community stakeholders participated in our initial sustainability goal setting. Then later, as part of military impact planning for growth at Fort Carson, the Installation with over 100 other individuals and organizations throughout the region, developed a long-term strategy called "Looking to Our Future—Pikes Peak Region 2030."

The timeline for achieving our original goals has since been accelerated from 2027 to 2020 under the Army's Net Zero Initiative

TRIPLE NET 0

for energy, water and waste.

We aim to provide a summary of our progress, challenges and accomplishments in this annual report. We have made important strides in many areas, but we still have a long way to go! We hope that you will give your support, encourage regional action and make a difference with us as we journey onward.

Mary J. Barber
Installation Sustainability Officer

Inside this report:

Sustainable Fort Carson

A **Net Zero Energy** Installation reduces overall energy use; maximizes efficiency, energy recovery, and cogeneration opportunities; and offsets the remaining energy demand with the production of renewable energy.

Photovoltaic array on Fort Carson

Energy Efficiency and Renewable Energy

Energy efficiency is the first priority. Since 2003, we have reduced our energy use per square foot (energy intensity) by 16% even though we have added over 5 million square feet of new construction. We plan to implement projects and activities to achieve a 50% reduction by 2020.

2014 Energy Efficiency Efforts and Renewable Projects

- Inside and outside lighting upgrades
- Building control system scheduling optimization
- Partnering with an Energy Savings Performance Contractor to identify additional opportunities

We intend that 100% of our energy requirements will be from renewable sources, preferably by generating all of our energy (power and heat) onsite over the course of a year so that we achieve "net zero".

Energy Intensity Down
(Compared to 2003 baseline)

- 3.8% of electricity generated from photovoltaic (solar) energy systems; 1400 kilowatts solar added
- 45% wind and biomass power purchased from utility (ending 2015)
- About 1% of thermal or heat energy generated on post

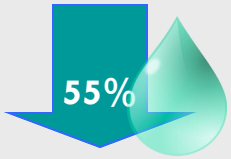
Net Zero Water

The Net Zero water strategy balances water availability and use to preserve a sustainable water supply for years to come.

Water Efficiency and Reuse

Since 2002 we have reduced our water use per square foot (water intensity) by 55% through improved efficiency and conservation. Our 2020 goal to reduce water use by 50% has been achieved!

Water Intensity Down



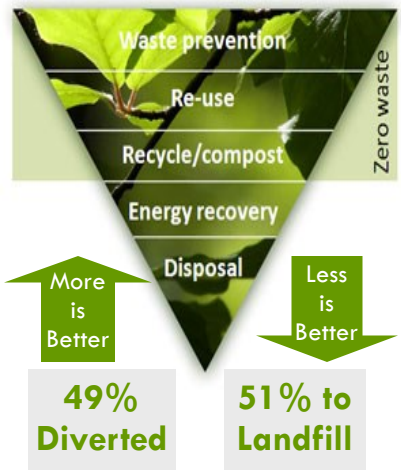
Compared to 2002 baseline

Water Efficiency Projects

- Water fixtures such as urinals, toilets and showerheads replaced
- Weather irrigation controllers operated on large turf areas, such as sports fields

Water Reuse Projects

- Post golf course irrigated with reclaimed, treated wastewater
- Reclaimed water lines added for irrigating other high use turf areas such as Ironhorse Park and Sports Complex



Zero Waste

Reused or recycled 91% of items processed through the hazardous waste facility (7296 lbs to landfill)

The **Net Zero Waste** hierarchy consists of preventing and reducing, reusing, repurposing, recycling, composting and recovering energy, with disposal being non-existent.

Waste Prevention and Reduction

Preventing and reducing waste must be our first priority, but remains the most difficult to address. Purchasing behaviors, product packaging and convenience items continue to challenge zero waste goal success.

Materials Diverted

- Cardboard, cans, plastic, paper
- Batteries and fluorescent bulbs
- Mattresses
- Food waste
- Paint, stains and solvents
- Automotive products
- Electronics and data media
- Scrap metal, porcelain, construction and demolition waste
- Wood pallets (for energy recovery)

Sustainable Fort Carson

Sustainable Procurement

Purchasing goes hand in hand with zero waste. Optimally, we consider the entire "lifecycle" of a product or service when making procurement decisions, not just initial cost.

Recycled Content & Biobased

- 50% or more post-consumer recycled content print/copy paper preferred
- Items such as plant-derived cleaning and food service ware required or encouraged

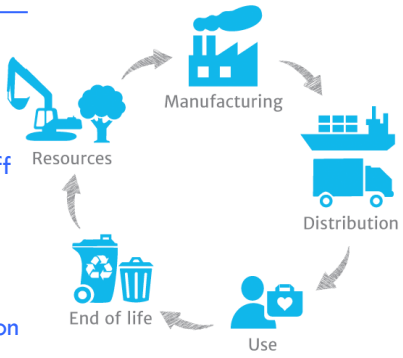
Energy & Water Efficiency

- Appliances meet strict energy efficiency standards
- Exterior and interior lighting use LED technology
- No or low water using fixtures used in new construction and renovations

- Drought-tolerant, native plants and stormwater runoff used in landscaping

Awareness and Education

- All new government purchase card holders trained on "green" procurement
- Sustainable purchasing and zero waste promoted during Earth Day and other events
- About 9,000 Soldiers briefed yearly on environmental and health impacts of purchasing decisions



"Product Lifecycle" means the natural and other resources (e.g. energy, water, raw materials, infrastructure, labor) needed to assemble or manufacture a product, and the resources used to package, distribute, store, use and properly handle the product at the end of its useful life.

Sustainable Development

Development affects all other sustainability goals. It has three main elements.

High Performance Buildings

- Large collection of highly energy and water efficient buildings, maximizing daylighting, using recycled content interior finishes, diverting construction waste from landfills and using drought tolerant landscaping and rain gardens for stormwater.

Pathways and Trails

- More walkable, bikable and compact development with 2.4 miles of sidewalks, bike lanes and pathways added (over 113 miles total)

Stormwater

- 70 inspectors, engineers and maintenance personnel trained in low impact development techniques

"FORT CARSON HAS ONE OF THE LARGEST COLLECTIONS OF LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED) CERTIFIED PROJECTS AT A SINGLE LOCATION." — VINCE GUTHRIE, FORT CARSON

Sustainable Transportation

Changing our 'car culture' at Fort Carson has proven to be a huge challenge.

Sustainable Transportation strategies to reduce single occupancy vehicle commuting have not yet proved successful. We continue to invest in infrastructure and incentives to encourage walking, bicycling, car and vanpooling, mass transit and other modes of travel.

Free post shuttles circulate the built up area of Fort Carson and averages over 10,000 riders per month

Our transportation goal also includes strategies to reduce petroleum use, increase the use of sustainable, alternative fuels and improve the average fuel economy (i.e. mpg) of the non-tactical fleet. While we have reduced our fleet by over one-half since 2011, we have not met our desired fuel-related targets.

About 94% of us prefer to commute alone reflective of the rest of the Pikes Peak Region

Sustainable Fort Carson

Training Lands and Ranges

Soldier marking sensitive site in training area with Seibert stake

We must be good stewards of the land in order to sustain military training now and in the future. We manage over 374,000 acres of training lands and ranges comprising Fort Carson and the Pinon Canyon Maneuver Site (PCMS).

Land Conservation projects completed:

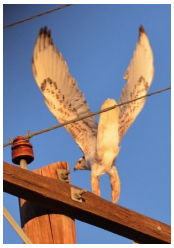
- 2 new erosion control dams
- 2 bank slope projects
- 1 trail rehabilitation
- 12 low water crossings
- 2 dam enhancements
- Land condition surveys

Cultural Resource activities:

- All currently known archeological sites reviewed by the State Historic Preservation Office for eligibility to the National Register of Historic Places
- 2 Programmatic Agreements completed to address undertakings on historic properties
- Unit and Soldier awareness about archeological site protection enhanced

Natural Resource projects completed:

- 167 acres thinned for forest health
- 170 acres treated for invasive plants
- Clean Water Act Section 404 Regional General Permit obtained to streamline projects



439 power poles retrofitted with insulation to protect raptors from electrocution—Ferruginous hawk

"WE NEED AIR, WATER, SUNLIGHT AND SOIL FOR LIFE AS WE KNOW IT." - SOIL SCIENCE SOCIETY OF AMERICA

KEEPING OUR AIR CLEAN BENEFITS OUR ECONOMY, HUMAN HEALTH, THE ENVIRONMENT AND COMMUNITY.

Air Quality

Actions we take to reduce energy and water use, to improve the efficiency of land development, buildings, and transportation systems, to buy green products and to reduce waste all contribute to less greenhouse gases (GHG), hazardous and other air pollutants.

While we did not meet our target for reducing greenhouse gases in 2014, we did decrease total GHG emissions by 1% over the previous year. Hazardous and criteria pollutants each saw a similar 1% decrease.

One of seven Level II Electric Vehicle Supply Equipment stations installed on Fort Carson. Electric vehicles help reduce petroleum use and many categories of air emissions.

Projects

- New, energy efficient buildings constructed
- Energy retrofits completed
- Low emission heating and cooling systems installed
- Solar array initiated
- Less prescribed fire activity

Speakers at local events like this March for Climate Action help inform the community about Sustainable Fort Carson and Army sustainability initiatives

Awareness, Conservation & Behavior Change

Awareness, dialog and outreach lead to conservation, behavior change and community support of initiatives.

Soldiers, Employees, Tenants & Contractors

- Facility Manager program development to support Net Zero
- Initial and refresher training for Environmental Protection Officers; assistance to units and Soldiers on operations and environmental impacts
- Regular performance reviews with leaders and recognition of environmental champions

Community Involvement

- Activities with school children, teachers and parents
- Household hazardous and electronics waste collection
- Installation and community messaging and presentations
- Collaboration with local agencies, institutions and organizations

Challenges Provide Opportunities

Low utility rates make return on investment for on-site renewable energy sources less favorable for development

Renewable energy for purchase or transmission through local utility provider limited

Water rights law makes grey water, reclaimed wastewater and untreated water use problematic, but not impossible

Car-oriented community development patterns do not favor alternative means of transportation

Use of sustainable, alternate fuel limited by infrastructure, vehicle availability and cost

Occupants, operators and maintenance workers must learn about and interact differently with LEED buildings

Low impact development reduces downstream stormwater impacts; changes landscape maintenance

Many requestors and purchasing mechanisms; choosing "greener" products and services from mandatory sources can be confusing

Single stream recycling improves rate, but lowers income for operations; waste-to-energy may be a viable alternative for zero waste

Changing climate and weather impacts infrastructure, health and natural resource condition

Resource constraints and unpredictability inhibit investments in sustainability-oriented initiatives

Successful partnerships like all relationships require time, effort and nurturing

Personal Rapid Transit System similar to the one existing at Heathrow Airport, an innovative transportation solution proposed to reduce single occupancy driving on and around Fort Carson

People Who Make a Difference Every Day

We'd like to say thank you to the following individuals and organizations who make the vision of a Sustainable Fort Carson and best 'Pikes Peak Region' a possibility.

Fort Carson

- Major Andrea M. Peters, Group Engineer, 10th Special Forces Group (Airborne)
- Mr Rick Kuper, Information Management with Family, Morale, Welfare and Recreation
- Ms Susan Galentine, Outreach and Public Relations Contractor, Public Works

Community

Many groups and individuals support Sustainable Fort Carson by promoting and taking steps towards sustainability in their own businesses, organizations, institutions and communities. All of us working together towards similar goals has a positive influence on regional sustainability.

Special thanks to participants in the monthly sustainability breakfasts co-hosted by Fort Carson, Peak Alliance for a Sustainable Future and Catamount Institute (CI) Also, kudos to CI for hosting yet another successful annual conference in 2014.

Again, to all organizations and people out there doing what it takes every day to bring us closer to our sustainability vision, we thank you for being the change!

"YOU MUST BE THE CHANGE YOU WISH TO SEE IN THE WORLD. IF YOU CAN IMAGINE IT, YOU CAN CREATE IT." - MOHANDAS K. GANDHI

How You Can Help

"One generation plants the trees; another gets the shade." - Chinese proverb

Earth Day tree planting on Fort Carson

Small actions make a difference. Small actions taken together change the world!

You Can

- Turn out the lights
- Turn down the heat
- Turn air conditioning off/up
- Plant native trees, shrubs and wildflowers
- Put in a rain garden
- Walk, bike, take the bus
- Give a buddy a ride
- Think before you buy
- Buy recycled content and plant-based products
- Grow your own food
- Buy food produced by local farmers and ranchers
- Eliminate plastic in your life
- Reuse, recycle and compost
- Donate lightly used items
- Get involved
- Be a change agent!

Soldier reading "The Lorax" to students on Earth Day

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"A single, ordinary person still can make a difference – and single, ordinary people are doing precisely that every day." - Chris Bohjalian

The Starfish Story — Loren Eiseley (1907-1977)

"Once upon a time, there was a wise man who used to go to the ocean to do his writing. He had a habit of walking on the beach before he began his work.

One day, as he was walking along the shore, he looked down the beach and saw a human figure moving like a dancer. He smiled to himself at the thought of someone who would dance to the day, and so, he walked faster to catch up.

As he got closer, he noticed that the figure was that of a young man, and that what he was doing was not dancing at all. The young man was reaching down to the shore, picking up small objects, and throwing them into the ocean.

He came closer still and called out "Good morning! May I ask what it is that you are doing?"

The young man paused, looked up, and replied "Throwing starfish into the ocean."

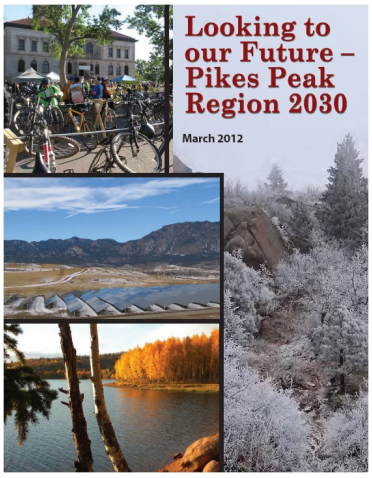
"I must ask, then, why are you throwing starfish into the ocean?" asked the somewhat startled wise man.

To this, the young man replied, "The sun is up and the tide is going out. If I don't throw them in, they'll die."

Upon hearing this, the wise man commented, "But, young man, do you not realize that there are miles and miles of beach and there are starfish all along every mile? You can't possibly make a difference!"

At this, the young man bent down, picked up yet another starfish, and threw it into the ocean. As it met the water, he said, "It made a difference for that one."

"Looking to Our Future: Pikes Peak Region 2030"



- Agriculturalists provide a high percentage of safe, quality food for the region and agricultural land and water preserved
- Arts and culture contribute to social and economic vitality of the region
- Built and natural environment complement one another and enhance the lives of people, promoting community, culture and commerce, and preserving and protecting the natural environment
- Strong and diverse economy that supports and benefits from sustainability
- Comprehensive, affordable and life-long educational opportunities available to all
- Considerable progress made towards 100% sustainable energy usage
- Healthy, long-lived population with a good quality of life
- Significant progress toward a net zero waste future
- Sustainable, equitable and affordable multi-modal transportation system
- Water use efficient and met by currently-owned water supply

(adapted from "Looking to Our Future: Pikes Peak Region 2030, Mar 2012)